

Chapter 6

Artificial Intelligence in Tourism

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ABSTRACT

Artificial intelligence in tourism activities opens a bundle of emerging applications for tourists and companies. This chapter aims to delineate the stages of the tourist journey and the usage of four types of intelligence suggested in the literature: mechanical, analytical, intuitive, and empathetic. Based on these two ideas, the authors propose a useful framework for disentangling the different types of current and future applications of AI in tourism. Each stage involves multiple suppliers with different types of AI applications, and its adoption will ultimately rely on tourist trust and, therefore, willingness to share data and the use of robotics and other AI forms. The chapter ends with some trends and reflections on the expansion of AI in tourism that pivot around these ideas: job replacement and flexible operations; mobile-centric approach; data integration and analytics; revenue management and customer interactions tension; (v) neuroscientific tools for AI in tourism.

1. INTRODUCTION

Popular beliefs about the role of tourism often overlook the technological aspect, which is mainly due to tourism's association with leisure and vacation. However, this belief is far from reality, and some examples from the past may change this view. The tourism industry has been a leader in innovation in two ways: (i) the development of loyalty cards that were initially created for use in airlines; and (ii) the global distribution systems (GDS), referring to the worldwide computerized networks that provide multi-access to a single source database and that are used for booking and are associated with the modern platforms provided by the Internet. The adoption of artificial intelligence (AI) by leaders in the tourism and hospitality industries is no exception. The technologies available in airports, such as self-check-in, access to boarding gates through QR codes, and automatic passport control through facial recognition or the scanning of passports, are some of the AI tools visible to tourists. However, other uses of AI

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are not as visible to customers, such as its use in revenue management, fuel optimization, maintenance alerts, and other company operations. Furthermore, other AI applications are still being developed, such as self-flying aircrafts, and Airbus has developed an automated, computer vision-based take-off and landing platform.

Based on previous contributions (Huang & Rust, 2018; Tussyadiah, 2020), I define AI herein as myriad human-computer processes that allow users and firms to add value to their interactions through data gathering and analysis, resulting in operations and actions that optimize customer-to-company (C2C) and business-to-business (B2B) interactions. This definition involves the interaction of the following three elements: devices, analysis, and availability. First, a technological device (e.g., smartphone, computer, sensor, scanner) captures, stores, and transmits data from users or the environment to other end users or devices through the Internet of Things (IoT). For instance, a temperature sensor in a space (e.g., a restaurant, hotel, or aircraft) can measure the current temperature, interpret it, and transmit this value to another device to trigger a planned action (e.g., turning an air conditioning unit on or off or opening a window). Second, data analysis is a predominant part of AI. For instance, AI can be used to track tourist movements and information, such as the number of visits to a tourist attraction, restaurant, or area, the number of comments and pictures posted on social media, and the number of nights spent at a destination or in a hotel. However, this numerical, textual, or visual information requires mathematical algorithms for its analysis, ranging from basic techniques (e.g., counting people and detecting emotions based on comments posted on social media) to more advanced machine learning (ML) techniques that are used to detect future patterns or suggest prescriptive actions. Lastly, the stored and analyzed information is delivered meaningfully to different recipients, such as organizations, companies, or users. For instance, the data can be used by destination management organizations (DMOs) to delineate tourist paths through a town in ways that preclude queuing, flight bookings can be used to predict the hotel accommodation services or restaurant supplies needed, or online hotel reviews can be used to predict occupancy rates.

This chapter aims to inform students, companies, researchers, and stakeholders about the application of AI in the tourism and hospitality industries. It is written from a user's perspective and through the lens of human-device interaction. Therefore, this framework combines two realms of research: (i) the tourist journey that encompasses the activities prior to traveling to a destination, at the destination, and those related to the journey after it is concluded; and (ii) the four types of intelligence used in services, as defined by Huang and Rust (2018). Figure 1 depicts a visual guide of my approach to combining the two realms of research, the supplier and user relationships (B2B and C2C), and the intensity of AI adoption in each relationship.

The rest of the chapter is structured as follows: I first address the multiple types of interrelated activities of tourism that affect AI, after which I analyze each stage of the tourist journey and the types of intelligence. I then discuss the future trends, risks, and dark sides of AI in tourism and hospitality, and lastly, I conclude with an analysis of the philosophical challenges faced by the increasing adoption of AI in terms of the ethical and societal implications.

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